STONEMAKER FUNGUS: A FIRE-RESPONSIVE HEAVY-WEIGHT OF THE FUNGUS KINGDOM

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In January 2005, we were told of a crop of large fungi that had emerged from the ashes after the severe bushfires in Carinyah Road, Pickering Brook about 25 km south-east of Perth. Some 7–10 days after the fires had been put out the first author visited the site along with Peg Griffiths and Eric McCrum. The fire had burnt through a small plantation of Geraldton Wax (*Chamelaucium uncinatum*) and seven fruit bodies could be seen in an area approx. 15 m x 3 m. Even though they were level with the ground or barely above it, the whitish fruit bodies were quite easy to see as they contrasted with the blackened soil surface and litter. Apart from the wax plants the area was clear of other shrubs and trees.

The fungi are *Laccocephalum tumulosum* (Cooke & Massee) Nunez & Ryvarden – formerly classified as *Polyporus tumulosus* Cooke & Massee. This fungus is known as the Stonemaker Fungus because the large pseudosclerotia consist of laterite pebbles (in this instance), some soil and a tough binding of mycelium resulting in a very dense mass (Figure 1). Sclerotia are compact sterile masses of fungal material with a hard outer rind. After existing in a state of dormancy for a potentially long period, sclerotia commonly germinate into a fruit body. 'True sclerotia' are entirely fungal whereas 'false sclerotia' or pseudosclerotia such as that of *L. tumulosum* incorporate other material such as soil. The pseudosclerotium that we dug out from about 1 metre underground weighed around 42 kg. The hefty weight is largely due to the lateritic soil incorporated in the sclerotium. The base of the pseudosclerotium to the top of the fruit body measured one metre indicating that this specimen had barely broken the soil surface. The cap measured about 20 cm in diameter with the stem measuring 2–3 cm for most of its length widening to 6–7 cm at the cap for another 13 cm. The 'stone' (pseudosclerotium)

Figure 1. The stonemaker fungus – *Laccocephalum tumulosum* showing (on right side) a fruit body arising from a pseudosclerotium and (on left side) a closer view of a fruit body with lateritic pebbles embedded in its stem.

measured approx. 40 cm, top to bottom and 24 cm at its widest, the whole resembling a large miss-shapen potato. Two dead roots, 2–3 cm in diameter passed through the pseudosclerotium, and various fine roots passed through the stem. No burnt logs or their remains were evident. The fruit bodies were at various distances from the wax shrubs, the nearest being approx. 80 cm. The pseudosclerotia were quite water resistant with drops of water remaining puddled on their broken surface for up to an hour before being absorbed. This softened the previously tough whitish, fungal material. One estimate of the age of the main fungal body is 46 years. This estimate was determined by a divining pendulum technique – interpreting the direction of swing taken by a string with a mallee wood weight held by hand over the fungus (Eric McCrum, personal communication). The fungus might be at least about 90 years old, as the natural forest was cleared for a stone fruit orchard at the Carinyah Road site in the 1910's. We produced a detailed description of the specimens, air-dried them, and lodged them with their data at the WA Herbarium.

Laccocephalum tumulosum occurs widely throughout Australia, including Tasmania (Reid *et al.*, 1979). It is a uniquely Australian fungus. In similarity with the several other species of *Laccocephalum*, the Stonemaker Fungus causes a brown rot of wood. *L. tumulosum* causes a brown cubical rot usually of large fallen eucalypt logs such as Jarrah (*Eucalyptus marginata*). A fungal process connects the log to the pseudosclerotium which lies in wait until a fire stimulates it rapidly to produce a fruit body. The fruit body emerges upon a long crooked stem from the blackened soil within 2 weeks of the fire, and spores are disseminated into the air from the pored fertile underside of the fruit body.

Many other Australian fungi respond in various ways to fire (Robinson 2001; Robinson & Bougher 2003). The closely related fungus *Laccocephalum mylittae* also fruits after a fire but it has a true sclerotium made up entirely of fungal material without any soil, stones or wood (see Bougher & Syme 1998). This edible fungus is known as Native Bread and occurs throughout Australia and New Zealand.

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